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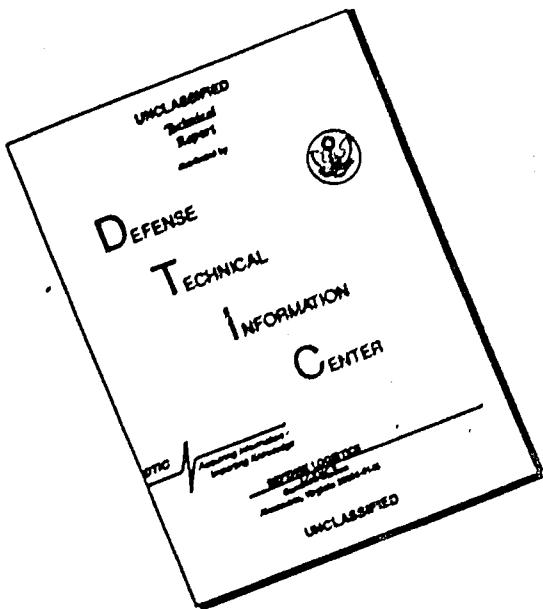
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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

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AGDA -A (M) (15 Mar 71) FOR OT UT 703258

19 March 1971

**SUBJECT: Operational Report - Lessons Learned, Headquarters, 589th
Engineer Battalion, Period Ending 31 July 1970**

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1. The attached report is forwarded for review and evaluation in accordance with para 4b, AR 525-15.

2. The information contained in this report is provided to insure that lessons learned during current operations are used to the benefit of future operations and may be adapted for use in developing training material.

3. Information of actions initiated as a result of your evaluation should be forwarded to the Assistant Chief of Staff for Force Development, ATTN: FOR OT UT within 90 days of receipt of this letter.

BY ORDER OF THE SECRETARY OF THE ARMY:

Verne L. Bowers

VERNE L. BOWERS
Major General, USA
Acting The Adjutant General

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DEPARTMENT OF THE ARMY
HEADQUARTERS, 589TH ENGINEER BATTALION (CONSTRUCTION)
APO SAN FRANCISCO 96321

EGACBF-CO

31 July 1970

SUBJECT: Operational Report - Lessons Learned, 589th Engineer Battalion (Construction), Period Ending 31 July 1970, RCS CSFOR-65(R2)

THRU: Commanding Officer
35th Engineer Group (Construction)
ATTN: EGA-3
APO 96312

Commanding General
18th Engineer Brigade
ATTN: AVBG-C
APO 96377

Commanding General
United States Army, Vietnam
ATTN: AVHGC-DST
APO 96375

Commander in Chief
United States Army, Pacific
ATTN: GPOP-DT
APO 96558

TO: Assistant Chief of Staff for Force Development
Department of the Army (ACSFOR-DA)
Washington, D.C. 20310

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31 July 1970

SUBJECT: Operational Report - Lessons Learned, 589th Engineer Battalion (Construction), Period Ending, 31 Jul, 1970, RCS CSFOR-65(R2)

1. SECTION 1, OPERATIONS: Significant Activities

a. Headquarters and Headquarters Company (HHC)

(1) The company functioned in its normal mission of providing support to the Battalion Headquarters during the period of this report. Training was confined to the Battalion master training schedule. Special classes were scheduled and conducted when it was felt that additional training was needed to help us accomplish our mission more effectively.

(2) The utilities section continued to improve the living conditions in the Battalion area by performing light construction and minor repairs. In the Headquarters Company and BOQ area, all existing revetments which were made of 1" lumber siding containing a core of sand were replaced by 55 gallon drums filled with sand.

(3). The water point at C Company in Song Pha produced 344,000 gallons of water during the reporting period. The water point at Song Mio supporting and element of B Company and an element of 2/1 Cavalry, produced 329,000 gallons of water during the reporting period.

b. Company A

(1) During the reporting period, A Company's industrial complex was expanded by the addition of a Pioneer Model 300 roll crusher unit and a Cedar Rapids ~~EA~~ soil stabilization plant. The 300 unit was required in order to produce the $1\frac{1}{2}$ "(-) aggregate needed to feed the stabilization plant.

(2) Paving operations for this period included paving 5.45 kilometers of double lane asphaltic concrete on highway QL-11 in "Good View Pass" and 9.36 kilometers, double lane, on highway QL-1. A Cedar Rapids paver, model BSF2, was added to the paving train and with minor maintenance has shown very good performance in all types of paving conditions. The Barber-Greene SA-35 paver which was used in earlier paving operations has been retained as a back-up paver. For approximately one month during the reporting period the SA-35 was loaned to the 577th Engineer Battalion (Construction) for use in their ACR. It has been returned since that time and is now planned to be used with the paving train operating out of B Company's industrial complex.

(3) The asphalt plant has been operational for practically the entire reporting period. It was inoperative for three days while screens were replaced in the gradation control unit. Continuous vibration and heat from the aggregate had worn or broke these

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screens enough to render them ineffective in gradation control. During the last half of the period when frequent rains hampered road construction, more time than usual was available for plant maintenance. Efforts made during that time to improve the efficiency of the plant included enlarging of the aggregate feed hoppers by welding extensions to the flanges. This resulted in reducing the spillage of aggregate during the loading process. It was found that the edge molding on the pugmill door and paddle tips in the pugmill could be fabricated from steel stock on hand. These fabricated parts were used to replace worn parts as replacement parts were not on hand. The malfunctioning of a pressure relief valve in the hydraulic system was solved by substituting a fluid with higher viscosity (OE 30) for the previously used hydraulic fluid (OH 10). With an increase in precipitation, the need to keep the aggregate piles dry (especially the $\frac{1}{2}$ "(-) or fines) was observed. Membrane surfacing (36'x100') is now being used to protect the aggregate.

(4) Because of a shortage of MC70 and availability of other cutbacks, a substitution for MC70 has been made. 200/300 has been used to finish the shoulders on QL-11. The 200/300 was dedrummed in one melter at the asphalt plant and heated to approximately 250 degrees F to facilitate loading and distribution. However, it has been noted that all equipment must be cleaned out immediately or the 200/300 hardens sufficiently to clog both pumps and spray bars of the distributors.

(5) An asphaltic soil stabilization plant has been erected at the industrial complex site. Assembly of its components was completed prior to the end of the reporting period. Initial calibration of the plant was supervised by an advisor from the Quinton-Budlong firm; samples were collected and tested by the quality control laboratory of the battalion S-3 section. Additional tests will be conducted before full scale operation of the plant begins. Local civilian hire personnel are assisting in the dedrumming operation. As night shift dedrumming will be required to support increased plant operation, lights are being installed for that activity.

(6) During the reporting period blast rock was crushed into the following amounts of aggregate:

Base Course ($\frac{3}{4}$ "(-))	49,479 cu yd
Asphalt aggregate (1"(-) $\frac{1}{2}$ "(+))	2,485 cu yd
Asphalt aggregate ($\frac{1}{2}$ "(-))	4,783 cu yd

TOTAL PRODUCTION 56,747 cu yd

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Early in the period a significant amount of unscheduled maintenance was required which slowed production. Among the notable items requiring down time were readjustment of shaker box and replacement of V-belts on the secondary unit. The V-8 engine on the 42 unit was replaced and new batteries were installed on all engines. New check plates for the secondary unit were made to replace worn-out plates and the crusher's rolls were built up by welding with the Stoody Automatic Welder. New belts were installed on three conveyors. An enlarged and more complete PLL has been established for the quarry which should help to eliminate down time waiting for high mortality parts to become available.

(7) During June night shift operations began at the quarry. Whereas there had been one day crusher shift and one night-time maintenance shift before, now both shifts operate approximately 9 hours each with 2 hours maintenance time for each shift. A quota system has been implemented so that when the weekly quota is met, crushing operations cease and an eight hour maintenance period begins. This allows major maintenance to be done at least once a week.

(8) A new air intake system is in the process of being installed at the quarry. One central intake stack, measuring 17" dia. by 60 ft high has been erected. This stack will service the engines of the primary, secondary, and tertiary crushers and will double as a pole for lighting fixtures. The control box for electrical components at the quarry has been mounted in a conex to provide shelter from moisture and dust. Blast rock is temporary being pushed by a D-9 dozer to within scooploader operating distance of the primary feed hopper. This enables the blast rock to be loaded into the hopper without the use of the Euclid dump trucks of which two of the three on hand are deadlined.

(9) The 300 crusher unit which has been installed at the quarry site has been modified to meet present requirements by by-passing the screening unit. Beads have been welded at six-inch intervals on each of the smooth rolls to enable the rolls to pull larger $2\frac{1}{2}$ " aggregate through and therefore prevent build-up of aggregate above the rolls.

(10) The direct support maintenance platoon completed 223 job orders of a total of 284 job orders for the reporting period leaving 61 job orders not completed at the end of the period. The increase of job orders left open compared to 34 at the end of the last period is due to a large number of requisitions that are still in the "due out" category. Parts which have remained critical throughout the reporting period are:
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<u>ITEM</u>	<u>FSN</u>
Engine, 10 ton	2815-910-8218
Engine, 440 H4 Grader	2815-071-7904
Engine, 3/4 ton	2805-649-8545
Transmission, 5 ton dump	2520-973-4086
Transfer case, 5 ton dump	2520-973-4087
Carrier w/bearing, 10 ton	2520-692-6304
Repair kit, D-7E dozer	5330-948-4039
Transmission seal, track drill	3820-898-4791
Engine, $\frac{1}{2}$ ton	2805-678-1820
Transmission, $\frac{1}{2}$ ton	2520-678-1808
Differential, $\frac{1}{2}$ ton	2520-678-3123

(11) The battalion ASL section is now authorized 4578 line items with a zero balance of 11.8% (539 items). 4286 fringe items are on hand. This is an increase in ASL line items and is due to pick up 376 items in the IMG program. There have been 202 red ball requests submitted with 57 filled, 122 due out, and 23 cancelled.

c. Company B

(1) During this reporting period, Company B continued to put primary effort into completion of their industrial complex set up and final grading and organization of their base camp. Numerous operational support missions were assigned to the company, most of which have now been completed. Effort towards upgrading of highway QL-1 was reduced by the priority of other projects but the company was able to continue culvert construction and to return to fill and base course work at the end of the reporting period. Due to a change in TO&E and the formation of a 31 man provisional asphalt platoon, B Company's personnel strength increased from 115 men on 1 May to 173 men on 15 July 1970. The increase in personnel provided adequate staffing in all platoons and sections except the First and Second vertical construction platoons, which are currently 66% and 41% understrength, respectively, frequently causing culvert and other vertical construction to be delayed.

(2) Base camp development encompassed improving drainage, construction of a 192'x40' metal frame maintenance building, interior road and motor pool shoping, and development of a fuel supply storage area. Construction of the metal frame maintenance building was started on 7 July 1970. A total of 758 yards of select fill and 235 yards of base course was placed to prepare the site. Twenty-two footers, using 18 yards of concrete, have been placed. All steel beams and roofing were erected and 98 cubic yards of concrete was placed for the floor. Development of the base camp access roads and motor pool was

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accomplished by placing 800 yards of fill and 1000 yards of the base course. To ease critical fuel re-supply problems, a 30,000 gallon diesel fuel storage tank farm was constructed. The farm consists of two 10,000 gallon steel bolted tanks constructed on site and one mobile 10,000 gallon wheel-mounted tank. The pipe system provides a common manifold for the tanks with 3 each refueling stand-pipes as required.

(3) The majority of the company effort concentrated on finalizing the industrial site operation. On 19 May 1970, construction was started to install a 75 TPH secondary roller mill to produce asphalt aggregate. Fifteen yards of concrete were placed to provide a pad for the unit. In order to feed the 75 TPH unit a "splitter box" was constructed to divide the produce of the 250 TPH Cedar Rapids unit into a base course stream and a 75 TPH unit feed stream. The splitter box is constructed of 5/16" plate metal and consists of two rock chutes welded together in an inverted "V" with an adjustable "flapgate" at the center of the "V". The 75 TPH became operational on 12 June 1970. Construction at the asphalt plant involved placing of 128 yards of concrete to complete preparation of the plant pad. All of the component units of the 130 TPH continuous mix plant have been installed. The aggregated processing units of the plant have been checked mechanically. Asphalt and hot oil plumbing has been installed. Also constructed was a 48' timber bent de-drumming platform. In conjunction with the de-drumming platform an earth ramp to the height of the de-drumming platform was constructed to facilitate loading of the de-drumming platform. The ramp also services as one side of the asphalt storage area protective berm. A unique feature of the plant is the automatic aggregate feed. This is accomplished by means of a tunnel feed buried in the base of the stock pile which feeds a standard 54 ft Barber Greene conveyor. The feed tunnel was constructed from a reciprocating feeder, FSN 3820-930-0508, housed in a frame constructed of 3" angle iron and 5/16" plate metal. The reciprocating feeder feeds aggregate onto a horizontal conveyor which is housed in a 72" corrugated metal pipe. The horizontal feeder feeds the 54 ft Barber Greene conveyor which elevates the aggregate to the feeder bin of the asphalt plant. Two separate tunnels were constructed to feed 1" minus and $\frac{1}{2}$ minus aggregate. Other construction at the asphalt plant included a 18' by 60' splitter wall to separate the asphalt aggregate stockpiles. The splitter wall was constructed by sheeting creosoted poles with 2" by 12" lumber. A frame shed to house the hot oil heater was also constructed. The scheduled test run of the plant will be in the second week of August.

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(4) Production and use of construction material consisted of 43,920 cubic yards of 2" rock, 141 cubic yards of 1" rock, and 120 cubic yards of $\frac{1}{2}$ "(-) rock while the quota for crusher production was 99,000 yards of rock for the period. 28,427 cubic yards were issued to the 61st ARVN ENGR BN and to company B projects. Eight days of crushing time were lost due to installation of the 75 TPH unit. Difficulties in keeping the tracked rock drills operational continued to be a serious problem in attaining quota production. Crusher feed material frequently contained excessive overburden and surface rock. This material made excellent base course, but the overburden, especially when wet, tended to choke the jaw crusher and screening units. It was found that surface rocks, with rounded surfaces and no partial fractures, would not pass through the crusher as easily as equal sized blast rock, causing excessive down time needed for clearing the jaws.

(5) Progress on construction of QL 1 was retarded somewhat, with 50,386 cubic yards of select fill being placed, raising 6.2 kilometers to grade. 1.11 kilometers of base course were placed and compacted, using 3065 yards of base course. Four 3-barrel, 48-inch, culverts; one 2-barrel 48-inch culvert; and one single barrel, 36" culvert with concrete headwalls were constructed during this period.

(6) An operational support project for construction of Fire Base Mike Norton, serving the 5/27 Artillery Battalion, was undertaken involving preparation of a 74 meter diameter, 6 - gun position atop a granite hill. Approximately 3,000 yards of rock were blasted and pushed off the peak of the hill to form a base for fill. The hill top was widened to 74 meters by placing 5100 yards of fill to bring the sloped sides within the 74 meter circle to grade. Additionally, a 300-meter road was constructed to provide access to the fire base. Other construction at the fire base included placing a 20'x80' mess hall slab and construction of a 100' man shower and latrine facility. The effort during this period involved 3,102 man-hours and 1¹,146¹ equipment hours. An operational support project involved repair work for a 5/22 Artillery Battalion fire base at Song Mao was also completed. 1,840 yards of fill was placed and compacted to reconstruct 2 parapets for 8 inch guns and 2 parapets for 175mm guns. In addition the ready reserve ammunition bunkers were reconstructed and properly braced to stand the shock of large bore guns firing over them. Drainage construction at Camp Blackhawk home of the 2d Squadron, 1st Cavalry was also included in the same project.

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The effort expended during this period included 1467½ man hours and 454 equipment hours. Continuous repair of the Song Mao M8A1 ratting airfield was accomplished during the period requiring commitment of Company B's 600 amp welder, (this commitment delayed the availability of a welder for the B Company industrial area until 1 July 1970 when an additional welder was acquired). Because of subgrade failure in several sections of the airfield, B Company recently has committed additional personnel to this effort. During the period two 100 ft sections of the airfield were stripped and replaced. Effort included 1216½ man hours and 179 equipment hours during this reporting period; the work is continuing.

d. Company C

(1) During the reporting period 1 May 1970 through 31 July 1970, Company C of the 589th Engineer Battalion (Const) was engaged in the upgrading of the "Good View Pass" on highway QL-11 from coordinates BP 466097 - Bridge 38.26, to coordinates BP 462103 - Bridge 39.00, and maintaining traffic on QL-11 from coordinates BN 619957 - Bridge #16 to BP 462103 - Bridge #39 (31 kilometers of roadway) through maintenance operations. Due to erosion of the shoulders and ditches between Bridge #16 and Bridge #27, a significant amount of effort was applied toward reconstructing the ditches and expanding the existing shoulders to eight feet width in final preparation for turning the road over to the Ministry of Public Works. Recovery of disabled Allied and civilian vehicles in the AOR continued during this period. During the reporting period, Company C was also engaged in the improvement of the base camp and maintenance of perimeter defenses. The "Mountain Movers" of Company C, were involved in training and operations for a total of 92 days.

(2) The upgrading of QL-11 in "Good View Pass" has been a combined effort of the Earthmoving Platoon and the two General Construction Platoons. During the reporting period a total of 14,035 cu yds of select material were placed and compacted, 32,080 cu yds of unsuitable material removed, 17,110 cu yds base course placed and compacted, 19 culverts constructed and placed, and 13,538 cubic feet of retaining wall built. The majority of the culvert construction was done by the First Construction Platoon. The Second Construction Platoon, augmented by Vietnamese permanent hire personnel constructed most of the stone masonry retaining walls. Efforts to increase the roadway width in the "Good View Pass" by blasting were continued during this reporting period. A total of 143 eight foot holes were drilled and a total of 3240 pounds of dynamite was used. The recorded rainfall for the month of May was 2.5 inches, for June was 9.65 inches, and for July was 2.55 inches. The total rainfall during the reporting period was 14.70 inches.

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(3) A continued maintenance program has been employed to insure that QL-11 between Bridge #16 and Bridge #39 is kept open to facilitate an increasing flow of commercial and private traffic. This maintenance program has consisted of repairing culverts and headwalls damaged by heavy rains, the cleaning of ditches in "Good View Pass" and retrieving disabled Free World Military Forces and civilian vehicles. The deteriorated timber decking on Bridge #16 continued to be a constant maintenance problem as 10 large holes in the bridge had to be repaired plus decking had to be replaced quite frequently.

(4) The upgrading of shoulders and ditches on QL-11 between Bridge #16 and Bridge #27 involved extending the shoulder width to eight feet along a length of roadway 5.45 kilometers long and placing and compacting base course along the shoulders from Bridge #16 to Bridge #27.

(5) Work in the Company C cantonment area consisted of cleaning of high grass and brush from around the perimeter, placing additional claymore mines, repair and replacement of perimeter wire, and the construction of arms storage areas in each guard bunker.

e. Company D

(1) During this reporting period, the primary effort of D Company was placed on LOC upgrading of QL-1, construction of an additional off loading facility for rail haul of base course from Phan Rang, culvert and bridge construction on QL-1, and repair of culverts on QL-11 damaged by enemy activity. Relocation of borrow pits and completion of the segment of QL-1 in the rice paddy area have contributed to a marked increase in the linear rate of road construction.

(2) The earthmoving platoon placed and compacted 87,415 cubic yards of select material and 10,970 cubic yards of spoil material were excavated in opening new borrow pits. 10,335 cubic yards of sand were hauled in support of the rice paddy fill operation. A total of 15,297 cubic yards of base course was placed on road south of Phan Rang. A total of 148,00 gallons of water was used on road. The vertical construction effort on QL-1 consisted of the construction of two bridges and one 3-barrel culvert. The construction of an off loading site (BN701616), was halted temporary because of repairs required when the enemy damaged two culverts on QL-11. The earthmoving platoon constructed by-passes at the two damaged culvert sites. The vertical platoon repaired the extensive damage by constructing one 2-barrel, 48" CMP and one 5-barrel, 60" CMP culvert including new footers and headwalls. A total of 910 feet of culvert was placed during this period. Approximately nine kilometers have been paved from BN800766 to BN73720.

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(3) During this reporting period D Company again had the opportunity to train and graduate 9 ARVN Engineer soldiers. Their training was conducted almost entirely "On The Job". Because of communication difficulties, classes were given by an interpreter, but the majority of the learning came through supervised operation of equipment.

f. 513 Engineer Co (DT)

(1) During the report period the mission of the 513th Engineer Company (DT) was to support the 589th Engineer Battalion (Const) in the building of highway QL-11 through the lower half of "Good View Pass", highway QL-1 south of Phan Rang, and the 577th Engineer Battalion (Const) in the building of QL-11 on the upper half of "Good View Pass". The first platoon stationed at Phan Rang Air Force Base, had the task of hauling to the lower half of the "Good View Pass", while the second platoon, attached to A Company 577th Engineer Bn. (Const), supported that Battalion's effort by hauling to the top half of the "Good View Pass", from Don Duong.

(2) The First Platoon hauled 9,568 cubic yards of base course to C Company, dumping it on the lower portion of the "Good View Pass", 1,134 cubic yards of base course to D Company, and 17,454 cubic yards of base course to the railroad loading site located on Phan Rang Air Base. This gave the 1st Platoon a total of 28,156 cubic yards of base course hauled during this period. Furthermore the 1st Platoon also hauled 2,754 tons of asphaltic concrete to C Company and 1,600 cubic yards of sand and base course to a variety of other locations.

(3) The Second Platoon, located at the top of the "Good View Pass", hauled 38,473 cubic yards of base course, 18,324 cubic yards of crushed rock and 17,857 tons of asphalt to the upper half of QL-11 in the "Good View Pass" and QL-21L. They also hauled 700 barrels of asphalt products and 450 cubic yards of sand to A Company 577th Engineer Bn. (Const) during this period.

(4) Ten MCA 12 cubic yard GMC dump trucks were attached from the 577th Engineer Bn. (Const), giving the 1st Platoon a total of twenty-five 12 cy dump trucks in operation at the beginning of this period. On 26 Jun 70 the ten 12 cy dump trucks (only 4 drivers were left) attached from the 577th Engineer Bn. (Const) returned to their home unit. During this period, the First Platoon received thirteen five-ton dump trucks and closed the period with fifteen 12 cy dump trucks and eighteen 5-ton dump trucks assigned.

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g. 585th Engineer Company (DT)

(1) During the period of 1 May to 31 July 1970 the 585th Engineer Company (DT) supported the 20th Engineer Battalion (Cbt), 589th Engineer Battalion (Const), and the 577th Engineer Battalion (Const) in Lines of Communication construction projects.

(2) During the period 1 May 1970 to 15 June 1970 while supporting the 20th Battalion Weigt-Davis Quarry, south of Pleiku, the unit hauled stabilized soil, base course, decomposed granite, and asphalt. A total of 45,360 tons of stabilized soil were hauled accumulating 133,322 miles. Only 20% of the effort was used to haul the base course, decomposed granite and asphalt. A contact team from the 62nd Maintenance Battalion, in Pleiku, RVN, was attached to the unit from 1 May 1970 until 15 June 1970. All major item components were set up on a walk through basis at DSU, thereby nearly eliminating delay in waiting for major item components. During this period the unit maintained a 10% deadline rate.

(2) On 15 June 1970 the 585th Engineer Company (DT) was attached to the 35th Engineer Group (Const). The unit subsequently commenced a five day maintenance stand-down from 16 June 1970 until 20 June 1970, preparing itself for a unit move from Weigt-Davis to the 589th Engineer Battalion (Const), at Phan Rang Air Base, RVN. On 20 June 1970 an advance party of 14 vehicles moved the unit's supply conexes and mess equipment, arriving in Phan Rang on 23 June 1970. The main body, consisting of 35 vehicles, arrived at Phan Rang on 25 June 1970. Both sections traveled the 300 plus miles between Weigt-Davis and Phan Rang without incident.

(3) On 27 June 1970, this unit made its initial base course haul for the 589th Engineer Battalion (Const) to "Good View Pass" on highway QL-11. The company continued hauling base course out of Phan Rang for Co "C", 589th Engineer Battalion (Const), until 1 July 1970, when we received a directive to send 30 dump trucks for temporary duty to the 577th Engineer Battalion (Const). This detachment departed Phan Rang on 2 July 1970, arriving at Don Duong, RVN, that afternoon. During the period 3 July 1970 to 26 July 1970, this detachment remained with the 577th Engineer Battalion (Const) hauling base course exclusively from the Industrial Site at Don Duong down into "Good View Pass", on highway QL-11, supporting both D Company of the 577th and C Company 589th. A total of 18,175 tons of base course was hauled during this operation. On 26 July 1970, the 30 truck detachment returned to Phan Rang Air Base and began an intensified three day maintenance stand-down period.

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(4) On 29 July 1970, the unit received a directive to send one platoon of 24 dump trucks to be attached to 19th Engineer Battalion (Cbt) in construction support of National Highway QL-21. On 31 July 1970, the 2nd Platoon departed Phan Rang Air Base, with 23 dump trucks and all of its personnel. During the reporting period the number of five-ton dump trucks varied from a minimum of 41 to the full authorization of 48.

h. Personnel

(1) On 22 May 1970, LTC Byron N. Schriever assumed command of the 589th Engineer Battalion (Construction) from LTC Donald A. Ramsay. LTC Ramsay left for CONUS on the same day. On 23 May, Captain Gerald R. Thiossen assumed command of B Company from Captain Joseph Feast Jr. who left for CONUS. On 15 June, the 585th Engineer Company (DT) was attached to the Battalion bringing 1LT Thomas L. Barron as Commanding Officer. On 11 July, Captain Byron L. Smith was succeeded in command of Company C by Captain Anthony R. Kropp. Captain Kropp departed the position of Assistant S-3 with the Battalion. 1LT Larry W. Owen assumed command of A Company from Captain Joseph A. Houch on 15 July. Captain Houch went to 35th Engineer Group Headquarters to head up their Industrial Complex Control Center. 1LT James G. Goetz, past Company D construction officer, succeeded Captain Frank A. Robertson in command of D Company on 31 July.

(2) Major staff changes included the assignment of Captain Byron L. Smith as S-3 Officer on 18 July, replacing Major Philip J. Galanti Jr. who departed for CONUS. On 17 July Captain Mark L. Weiss, the S-4 Officer left for CONUS. Captain Weiss was succeeded by 2LT Edmond Brown Jr. on 22 July 1970. The Battalion Signal Officer, 1LT Donald E. Alsted, left the Battalion on 12 July for ETS. His duties were assumed by the Adjutant, 1LT Russell Benant, III.

(3) On 15 June 1970, General Order 124 authorized a change in the Battalion's classification from type B to type A under MTOE 5-115GRO5. Due to the change, the enlisted authorized strength increased from 95% (790 men) to 96.8% (1119 men) of authorized strength. The projected losses for the next 90 days are 19 officers and 140 enlisted personnel.

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(4) The following critical MOS shortages exist within the Battalion:

<u>MOS</u>	<u>AUTHORIZED</u>	<u>ASSIGNED</u>	<u>60 DAY LOSSES</u>
51H40	32	21	3
62L20	45	13	0
64B20	194	134	14
76Y40	9	6	3

(5) A major difficulty which this section continues to encounter is receiving replacements in certain overage MOS's. For instance, we are authorized twelve 44C20's and assigned 22; authorized four 51N20's and assigned 13; authorized fifty-two 62B20's and assigned 69; authorized seven 91B20's and assigned 14.

(6). In order to alleviate the afore mentioned shortage and overage MOS's, this section endeavors to impress upon unit commanders the procedure to crosstrain and cross-level personnel of MOS's concerned. Under present circumstances, the procedure of cross-training has proved sufficiently effective to maintain the mission of the Battalion.

i. Religious Activities

(1) The total number of men in attendance at services has increased by 35 per week during this reporting period. Part of this increase is due to the increase in the number of personnel in the unit and also due to the additional services conducted by the Chaplain. The Chaplain spends one day and night at each of the three outlying units each week.

(2) Catholic coverage continues to be a problem due to the shortage of Catholic Chaplains within the 35th Engineer Group. However, we have been able to provide three masses per week - one in the headquarters area, one in C Company, and one in B Company. This coverage was provided by the Air Force Catholic Chaplains from the Base Chapel, Phan Rang Air Force Base, and by the Catholic Chaplain from the USA Support Command, Cam Ranh Bay.

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j. Intelligence and Security

- (1) Enemy activity in all parts of the 589th Engineer Battalion (Construction) AOR decreased during the reporting period with an exception of road and culvert damage which occurred along highway QL-11. Company D was tasked to supply most of the effort applied to repair of those damages. No effort other than the construction of bypasses was provided in the repair of QL-11 between Phan Rang and Tan My as that section of road had been transferred to the Ministry of Public Works at an earlier date.
- (2) Enemy activity during the report period consisted primarily of damage to LOC and rocket attacks against the Air Force facilities at the Phan Rang Air Base on which the Battalion's headquarters and four of its companies are located.
 - (a) On 23 May, one 290M tractor from D Company ran over a mine fabricated from TNT or C-4 explosive. The mine caused heavy damage to the piece of equipment. On the same day, also in the D Company area, a 5-ton dump truck hit a mine while backing into a sand pit area. The truck suffered one flat tire and other light damage.
 - (b) Culvert QL11-15.1, east of Tan My, was 100% destroyed by a detonation at approximately 2400 hours, 30 May.
 - (c) On 1 June, B Company reported that both spans of bridge QL1-41 were blown at the center pier. The bridge had been unused previously; by-passes existed.
 - (d) On 2 June, a railroad bridge near QL11 - 12 was blown. The damage interfered temporarily with the rail haul of base course to C Company.
 - (e) Phan Rang AB received 2 rounds of 107mm rocket at 1045 hours, 6 June; no injury and only minor damage resulted.
 - (f) On 10 June, Phan Rang AB received one 107mm round and later the same day, two more rounds. There were no casualties and damage was minor.
 - (g) Damage at two culvert sites was reported by C Company on 12 June. QL11 - 17 suffered all five barrels damaged and roadway and headwalls cracked. The headwalls at QL11 - 16.10 were 100% damaged and the two tubes also had to be replaced. Shaped charges appeared to have been used.

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(h) On 29 June, culvert QL11-12 was completely damaged by enemy charges. A by-pass was built.

(i) Phan Rang Air Base received two 107mm rocket impacts near the Air Force Quarry on 2 July. An A Company 10-ton tractor in the vicinity was hit by shrapnel causing four flat tires and a punctured gas tank, but no casualties.

(j) Two meters of railroad track between Phan Rang and Company C were damaged by explosives on 6 July.

(k) On 10 July, one 107mm rocket impacted on Phan Rang Air Base. There were negative casualties or damage.

(l) On 17 July, B Company reported that culverts QL1-43 and QL1-45 had received enemy damage. One was repaired the same day but the other required a by-pass.

(n) On 21 July, Phan Rang Air Base received one 107mm round in the vicinity of the main BX. One USAF man was killed; light damage was caused to the BX building.

k. Operations and Training

(1) Battalion effort continued to be concentrated on the LOC program during this period, although 124,020 manhours were diverted to operational support missions. A total of 816,547 cy of fill was hauled and placed on QL-1 and 10,204 cy of fill were placed on QL-11. On QL-11 a total of 80,095 cy of undesirable material was removed. Base course placed and compacted during the period totaled 38,282 cy. Thirty-four culverts and two precast bridges were constructed by the Battalion during this time; 10,728 sf of retaining wall were built in "Good View Pass" on QL-11. Paving during the period extend 13.74 km double lane, utilizing 15,654 tons of asphaltic concrete.

(2) Considerable effort was expended in making additions to the industrial complexes at A and B Companies, as mentioned earlier in this report. Paving of C Company's 10 km section of QL-11 in the "Good View Pass" was 95% complete at the end of the period. D Company continued paving through their rice paddy section of QL-11, south of Phan Rang, and moved on south of Phu Quy.

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(3) Local national hire continued to effectively supplement the work force of the line companies and also provide a team of dormainers to assist in operation of A Company's new stabilization plant. Local hire personnel have continued to be an asset to the Battalion. Crews have been formed along platoon lines which have remained fairly stable in composition, gaining from their experience of many months on the job. They have proved to be fully capable as carpenters and masons under US supervision.

(4) Training of ARVN engineer soldiers has continued during this period. Because of a lack of interpreters and inherent language problems, the best method of training these soldiers has been on-the-job, man-to-man. This technique allows first hand experience in both equipment operation and maintenance. Of the ARVN soldiers who began training with the Battalion in April, 12 were graduated in May and 4 were graduated in June. Because it was felt that some of the soldiers needed more training, the latter ones were held over until they reached a higher level of proficiency. On the 13th of July a new training period started. It is scheduled to continue until 3 October 1970. In this last period, 27 trainees are receiving instruction on the operation of D7E dozers, graders, front loaders, generators, cranes, air compressors, and 16S mixers and in mechanic's skills.

(5) Normal training within the Battalion has been carried out by the companies on a regular schedule developed by S-3, except when a company has determined that special additional training must be conducted in addition to that required. Cross-training has been utilized by the companies, particularly in the company maintenance area. Special emphasis has continued to be given during this period on training in weapons safety and safe driving and operating techniques.

1. Maintenance

(1) During this period the Engineer Equipment Maintenance Office continued to operate without the services of an authorized Master Sergeant, MOS 62B40. The lack of this experienced NCO greatly hampered the effectiveness and diversification which could have been offered by this office. The EEMO function was limited during the period to reaction to current problems, and their solutions; and not enough in the field of assistance and advice was available to be offered. The desired type of function, of course would serve to avoid many of these reaction type efforts. There will be a continuing effort made to obtain a qualified senior NCO to fill the slot.

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(2) Increased daily operation time, introduced through "Operation Last Chance" and maintained to a slightly lesser degree at the end of that operation, took a toll of increased deadline rates of TO&E and MCA equipment. Although time allotted for maintenance at company level was also increased, shortages of operational equipment, particularly 10-ton tractors, graders, and bucket loaders have remained critical. MCA equipment, such as 6 cy Hough loaders, Raygo vibratory compactors, and MCA and TO&E pneumatic tracked drills have also had excessive down time. Even though maintenance time was extended, lack of actual operator's maintenance and maintenance experience at all levels of company operation are believed to have added to equipment failures in addition to the heavy work load.

n. Medical Activities

(1) This medical section provided primary medical support for elements of HHC, A, B, C, and D Companies, on platoon of the 513th Engr. Co. (DT) and one platoon of the 73rd Engr. Co. During June the 585th Engr. Co. was also attached to this Battalion. Other Army units in the Phan Rang area, a platoon of D Company, 36th Signal Bn; a detachment of the 557th Lt. Maint Co; and a detachment of Military Police attached to MACV have been provided with medical care from this Aid Station. Vietnamese civilians working in the 589th area and civilian engineers from PA&E also use these facilities. The total number of outpatients seen during the period was 1443. Of these, 99 required hospital care or quarters to treat their illness.

(2) Medical personnel in this section remained the same since the beginning of this reporting period. Included in this group is one E-6 Staff Sergeant, one SP5 Clinical Specialist, one SP5 Senior Aidman and 11 medical aidmen. There are three line companies away from Battalion Headquarters and each has its own Aid Station with two of the above mentioned aidmen.

(3) Statistical figures for the reporting period are:

	MAY	JUNE	JULY	TOTAL
CUT PATIENTS	430	593	505	1527
HOSPITAL ADMISSIONS AND QUARTERS	33	41	40	114
IMMUNIZATIONS	220	200	220	640

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LABORATORY	265	330	371	966
PHARMACY	231	282	290	837
VIETNAMESE PATIENTS	28	39	33	100

(4) Support for this medical section comes from many different units. The 35th AF Dispensary is cooperative in providing X-Ray and Laboratory facilities. A Medevac unit located on Phan Rang Air Base provides excellent evacuation service to this Battalion. The 483rd AF Hospital cares for those needing intensive treatment and the 934th Mental Hygiene Clinic in Cam Rahn Bay provides Psychiatric Consultation service.

(5) Although regular visits to a Vietnamese Hamlet have been impossible in the past three months, due to an increase in work load at the Battalion Aid Station, a number of visits were made during the months of May and June. Many Vietnamese patients are brought into the Aid Station at Phan Rang by outlying MACV units and are treated here.

n. Communications

(1) The section functioned in its normal mission of providing signal support to the Battalion during the period of this report. Radio and teletype operators and repair technicians have been in adequate supply and competent in their jobs. Repair parts have been something of a problem: difficulties in this area have resulted in the establishment of a PLL maintained in the Comm section. Radio communications with the companies have been satisfactory, except on frequencies below 55 MHZ. As long as a frequency above 55 MHZ is used, there are no difficulties in obtaining the requisite range.

(2) Teletype communications have sometimes been interrupted by failure of aging equipment or of the microwave link between Phan Rang and Cam Ranh. Air Force technicians have been a frequent aid in repairing faulty teletype equipment. In the future it may be possible to work out an arrangement with the Air Force whereby they will also give us direct support on maintenance of crypto equipment. At present the nearest direct support facility for crypto equipment is at Nha Trang and while their work has been effective the long travel time has made the use of this facility inconvenient.

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d. Logistics

- (1) For the reporting period, the main activities of the S-4 Section have been the logistical support of the line companies of the Battalion, procurement of construction materials for the newly installed asphalt plant at Vinh Hoa and the newly installed Soils Stabilization Plant at Phan Rang, and support of the 61st ARVN Engineer Battalion (Const).
- (2) Equipment availability is high with critical shortages existing in the following items: Boom, Crane 30' (FSN 3815-752-9022, 3 of 6 on hand); Boom extension, Crane (FSN 3815-197-7311, 4 of 7 on hand); Generator Set, Gas Engine, 10 KW (FSN 6115-792-8260, 5 of 9 on hand); Mixer, Concrete 16S (FSN 3895-835-4512, 2 of 6 on hand); Semi-trailer, 25 ton (FSN 2330-317-6448, 19 of 24 on hand); and Welding Shop, Trailer Mounted, 300 amp (FSN 3431-287-5404, 1 of 6 on hand). In other areas during this period, the availability from depot of 24" and 48" CMP was non-existent.
- (3) The shortage of bedding items has created a problem within Battalion. There appear to be no bedding items for issue from the depots for the increase of 225 personnel authorized by MTCE 5-115GP05 dated 26 Feb 70.
- (4) The lack of technically skilled supply sergeants has created a hardship on the Battalion Property Book Officer, as well as a break in the continuity of the logistical support effort.
- (5) Transportation of material from Cam Ranh Bay to Hoa Da for support of the 61st ARVN Engineer Battalion (Const) has greatly improved in the past quarter. There is no apparent problem at the present time in the support of this program.

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2. SECTION 2, LESSONS LEARNED: Commander's Observations, Evaluations and Recommendations

- a. Personnel: None
- b. Intelligence: None
- c. Operations

(1) Wear of Screens in Asphalt Plant Gradation Control Unit

(a) OBSERVATION: The constant vibration and heat inherent in this unit causes the screens to weaken rapidly, making them more susceptible to splits or holes, thereby rendering gradation control ineffective.

(b) EVALUATION: These screens rest upon a lattice work of steel bars. The constant pounding of the screen against these bars tends to damage them beyond efficiency.

(c) RECOMMENDATION: That small sections of rubber hose be cut and split length-wise and fitted over the steel bars to act as a buffer for the screen.

(2) Hydraulic System of Asphalt Plant

(a) OBSERVATION: The pressure release valve of the hydraulic system would not function properly after the plant had been in constant operation for an hour or so.

(b) EVALUATION: The hydraulic fluid being used (OH 10) seemed to suffice while the oil was still relatively cool; however, after operating for a while the heat generated in this system had changed the viscosity of the fluid to allow the release mechanism to function improperly.

(c) RECOMMENDATION: A lubricating oil (such as OE 30) be substituted for the OH 10 because OE 30 oil maintains a proper viscosity at these higher temperatures.

(3) Convoy Procedures

(a) OBSERVATION: Even in areas of low key enemy activity, running single trucks in a dump truck operation often leads to cases of speeding problems and serious accidents due to carelessness, as well as, major problems of controlling vehicles when a change in operations is employed. Considerable down time for individual trucks has been experienced when trucks have waited on the side of the road for mechanical assistance.

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(b) EVALUATION: It has been experienced that small convoys of six to eight trucks afford maximum utilization of haul capability, by decreasing loading and unloading times and decreasing the number of control vehicles and personnel. Recent experience dictates that this is not a hard fast rule since small convoys cannot be properly utilized in areas where traffic control is a major factor, such as mountain passes or built up areas. In these instances large convoys are more practical since all trucks clear the congested area at one time.

(c) RECOMMENDATION: Small convoys of six to eight trucks should be utilized for maximum control, except in areas that present special traffic control problems.

d. Organization

(1) Manning of Additional Asphalt Equipment

(a) OBSERVATION: This battalion is operating a 300 ton per hour Barber Green Asphalt Batch Plant, a 300 ton per hour Cedar Rapids Scil Stabilization Plant, and a paving train from the Phan Rang area; and a 100 ton per hour Barber Green Continuous Asphalt Plant and a paving train from the Vinh Hoa area.

(b) EVALUATION: The authorization of a twenty two man Asphalt Section (intended only as a pot hole crew) in A Company and a thirty-two man provisional asphalt platoon made out of battalion assets is not sufficient to man the three plants and two paving crews and additional personnel must be assigned these duties to accomplish the mission. Many individuals do not have the opportunity to be promoted in the MOS that they are working because of a lack of vacancies and an entire plant or paving crew is frequently being supervised by an inexperienced SP5 or Acting Sergeant.

(c) RECOMMENDATION: An additional asphalt platoon should be attached to operate the asphalt and stabilization plant at Phan Rang.

e. Training: None

f. Logistics: None

g. Communications: None

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h. Material

(1) Wrecker or Recovery Vehicle

(a) OBSERVATION: With the increasing flow of traffic and number of disabled vehicles on the "Good View Pass," the recovery and removal of the disabled vehicles without benefit of a wrecker, became a critical problem.

(b) RECOMMENDATIONS: When a 10 ton tractor with winch is available, it can easily and quickly be converted to a satisfactory recovery vehicle by fabrication of a removable wrecker frame. This frame can be readily manufactured from a sheet of 3/8" steel, a 25 ton trailer pin, angle iron or pipe and a roller pulley. The pin is welded to the steel sheet so that it can be attached to the fifth wheel and the plate has to be bent slightly to conform to the configuration of the tractor. The angle iron is used to form an A frame with the roller pulley attached at the apex and is then welded to the plate and braced. The wrecker frame can then be bolted to the tractor for further rigidity.

(2) Angle Blade for D7 Dozer

(a) OBSERVATION: When cutting and removing a large amount of material with a dozer, it became apparent that a straight bull blade required much more time and effort expended to clear the cut material away from the work area, whereas as an angle blade could make a larger cut and clear the work area in one continuous motion.

(b) RECOMMENDATION: A very satisfactory angle blade can be fabricated from an unservicable Rame Plow blade and "G" frame. The only modifications necessary are removal of the stinger and increasing the blade pitch by extending the horizontal braces.

i. Other:

(1) Dental Service

(a) OBSERVATION: Due to an increase in the Army population on Phan Rang Air Base, the Air Force Dental Clinic can no longer support Army personnel. Long delays are incurred in obtaining dental care at Cam Ranh Bay also.

(b) EVALUATION: The dental unit at Nha Trang has sent an Army dentist to Phan Rang for a total of two weeks in the last three months which is inadequate to satisfy the requirement. The Air Force Dental Clinic states that they will make one of their chairs available to an Army dentist full time.

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(c) RECOMMENDATION: That an Army dentist be stationed full
time on Phan Rang Air Base.

Byron Schriever

BYRON N. SCHRIEVER
LTC, CE
Commanding

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EGA-CC (31 July 1970) 1st Ind

SUBJECT: Operational Report - Lessons Learned, 589th Engineer Battalion
(Construction), Period Ending 31 July 1970, RCS CSFCT-45 (R2).

DA, Headquarters, 35th Engineer Group (Const), AFN 96312, 24 August 1970

TO: Assistant Chief of Staff for Force Development, Department of the
Army (ACSFDR), Washington, D.C. 20310

This Headquarters has reviewed the Operational Report - Lessons Learned
for the quarterly period ending 31 July 1970 from the 589th Engineer
Battalion (Construction) and concurs with the comments and observations
of the commander.


RICHARD A. CHIDLEY

CCL CE

Commanding

AVBC-CG (31 July 1970) 2nd Ind
SUBJECT: Operational Report - Lessons Learned, 589th Engineer Battalion
(Construction), Period Ending 31 July 1970, RCS CSFOR-65 (R2)

DA, HEADQUARTERS, 18TH ENGINEER BRIGADE, APO 96377 18 SEP 1970

TO: Commanding General, U.S. Army Vietnam, ATTN: AVHGC-DST, APO 96375

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 589th Engineer Battalion (Construction), as indorsed by the 35th Engineer Group (Construction). The report is considered to be an accurate account of the Battalion's activities during the reporting period.

2. This headquarters concurs with the observations and recommendations of the Battalion and Group Commanders.


H. C. SCHRADER
Brigadier General, USA
Commanding

AVCC-MO (31 July 70) 3rd Ind

SUBJECT: Operational Reports - Lessons Learned for 589th Engineer Battalion (Construction), for the Period Ending 31 July 1970, RCS CSFOR-65 (R2)

DA, HQ, US Army Engineer Command Vietnam (Prov), APO 96491

TO: Commanding General, United States Army Vietnam, ATTN: AVHGC-DST, APO 96375

Subject report is under review in this Headquarters. Comments for inclusion in the Headquarters, USARV indorsement to CINCUSARPAC will be forwarded to your Headquarters by separate cover.

FOR THE COMMANDER:



ROBERT E. SHEA
CPT, AGC
Assistant Adjutant

AVHDO-DO (31 July 1970) 4th Ind
SUBJECT: Operational Report - Lessons Learned, 589th Engineer Battalion
(Construction), Period Ending 31 July 1970, RCS CSFOR-65 (R2)

Headquarters, United States Army Vietnam, APO San Francisco 96375 19 NOV 1970

TO: Commander in Chief, United States Army Pacific, ATTN: GPOP-DT,
APO 96558

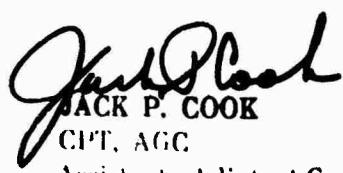
1. This Headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 July 1970 from Headquarters, 589th Engineer Battalion (Construction) and comments of indorsing headquarters.

2. Comments follow:

a. Reference item concerning "Critical Shortages," page 19, paragraph 1 o(2). Shortages have existed for some of these items. While some shortages exist in individual units because of asset distribution, USARV has a fill rate of about 90% on major construction equipment. Only two items are considered critically short; 25 ton semi-trailers and welders. Delivery information indicates trailers are due-in late 2d Quarter FY 71 and 3d Quarter FY 71. The welder shortage is expected to be alleviated by arrivals of machines in 2d Quarter FY 71 and 2d Quarter FY 72. Occasionally, certain construction materials (including CMP) are not available at a project/job site in the size/quantity desired. Substitutions of available material and/or redesign satisfy most requirements with no significant delay. Recommend USARPAC and DA expedite delivery of 25 ton semi-trailers and welding machines. Unit has been so advised.

b. Reference item concerning "Dental Service," page 22, paragraph 2i(1). When the Air Force could no longer fulfill the terms of ISSA 32-68, the Commanding Officer, 934th Medical Detachment (KJ) established an Army Dental Clinic at Phan Rang. This is a three chair clinic staffed full time by a dental officer, an enlisted hygienist and an enlisted assistant. This clinic became operational in October 1970. No action by USARPAC or DA is recommended. Unit has been so advised.

FOR THE COMMANDER:


JACK P. COOK
CPT, AGC
Assistant Adjutant General

Cy furn:
USAECV(P)
589th Engr Bn

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GPOP-DT (31 Jul 70) 5th Ind

SUBJECT: Operational Report of HQ, 589th Engineer Battalion (Construction)
for Period Ending 31 July 1970, RCS CSFOR-65 (R2)

HQ, US Army, Pacific, APO San Francisco 96558

24 ULL

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D. C. 20310

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:

L.M. Ozaki, Jr.
L.M. OZAKI
CPT, AGC
Asst AG

EGACBF-CO

31 July 1970

SUBJECT: Operation Report - Lessons Learned, 589th Engineer Battalion
(Construction), Period Ending 31 July 1970, RCS CSFOR-65(R2)

ORGANIZATION

The following units were either assigned or attached as indicated to the 589th Engineer Battalion (Const) during the report period.

- a. Headquarters and Headquarters Company
- b. Company A
- c. Company B
- d. Company C
- e. Company D
- f. *513th Engineer Company (Dump Truck) (One platoon was detached for temporary duty to the 577th Engineer Battalion (Construction) for the entire period).
- g. *Quarry Platoon, 73rd Engineer Company (Construction Support)
- h. *585th Engineer Company (Dump Truck) (Attached on 15 June 1970. Main body of company arrived on 25 June 1970. One platoon was detached to the 19th Engineer Battalion (Combat) on 31 July 1970).

* These were the only attached units. The rest are assigned units.

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